



Welcome to ESAC

The European Space Astronomy Centre

Christophe Arviset, Head of Data Science and Archives Division

ESA ESAC, Science Directorate

Software Product Assurance Workshop 2023, 26/09/2023

ESAC – a bit of history



1978: VILSPA, opening of ESA Villafranca Satellite Tracking Station, support to IUE mission



~1978





2004: VILSPA became ESAC reflecting extension of activities

2023: ESAC today about 450 people

- Science Operations Centres for all Science missions
- Science Archives for Science missions and HRE
- Earth Observation SMOS Spanish National Centre
- ESA GNSS Support Centre
- CAB – Centro de Astro Biologia (INTA)
- Satellite Tracking Station (-> Cebreros)

2023

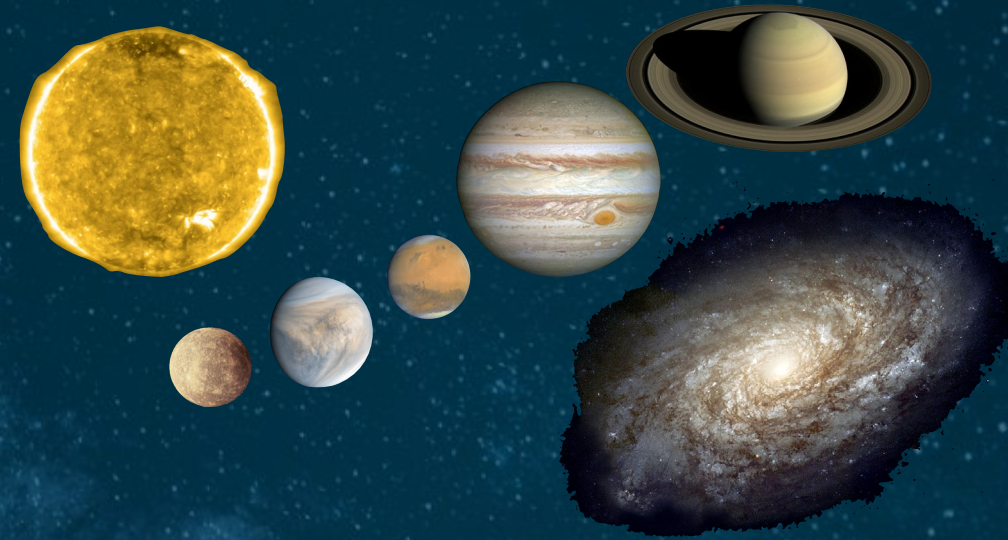


Budget: ~600 M€ yearly, defined at ESA's Ministerial Conference every three years

Staff: ~250 staff + ~250 contractors at ESAC, ESTEC, STScI and GSFC

A programme covering space missions in

- Heliophysics
- Planetary Science
- Astronomy and Fundamental Physics



The scientific community in the ESA Member States is consulted at regular intervals

- to provide the broad science schemes
- to select individual missions within a scheme

COSMIC OBSERVERS



IN DEVELOPMENT



ACTIVE



microwaves

sub-millimetre

infrared

optical

ultraviolet

x-rays

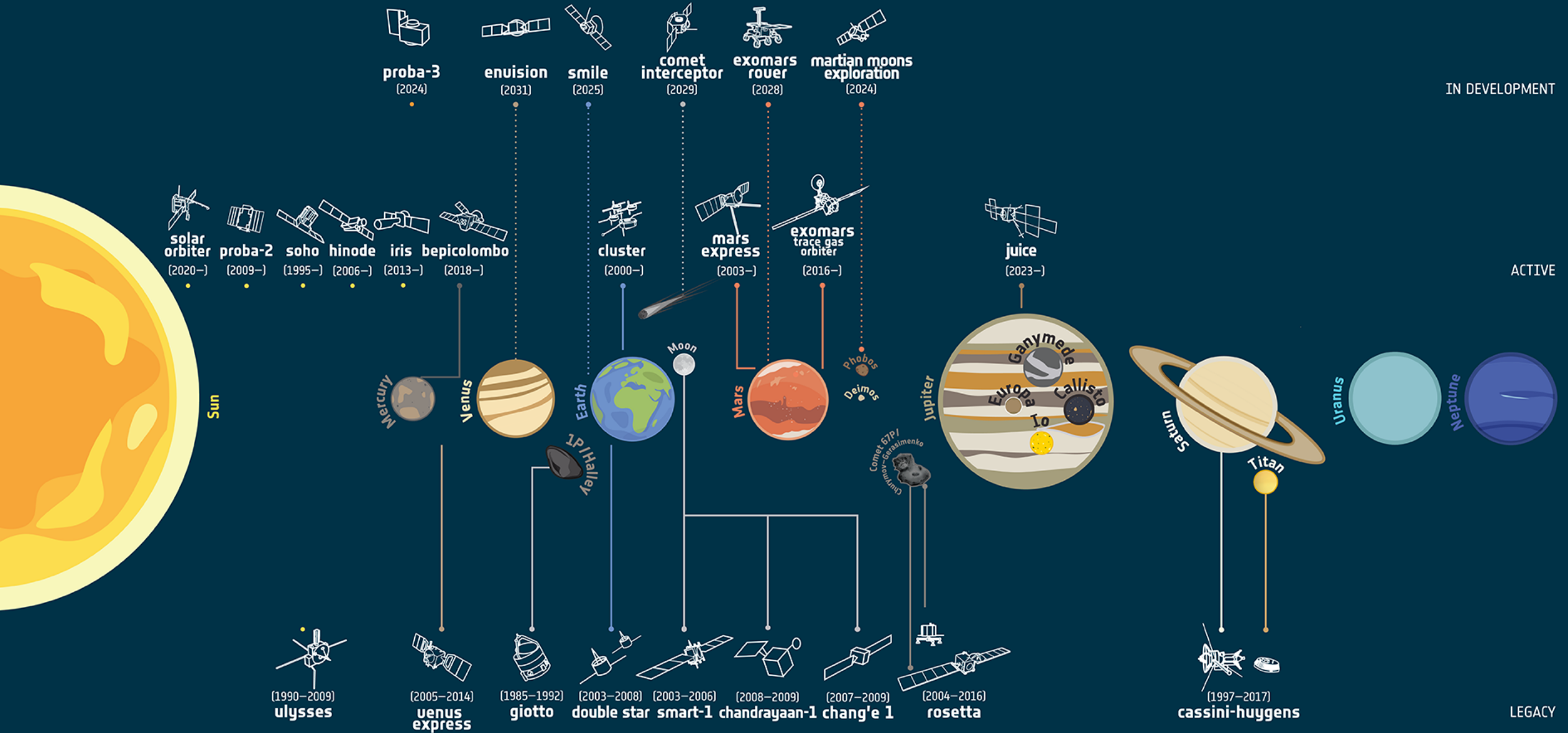
gamma rays

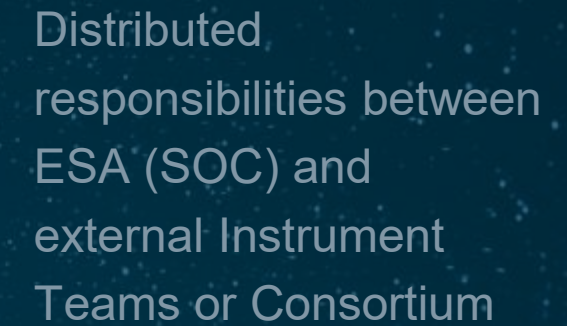
gravitational waves

LEGACY



SOLAR SYSTEM EXPLORERS

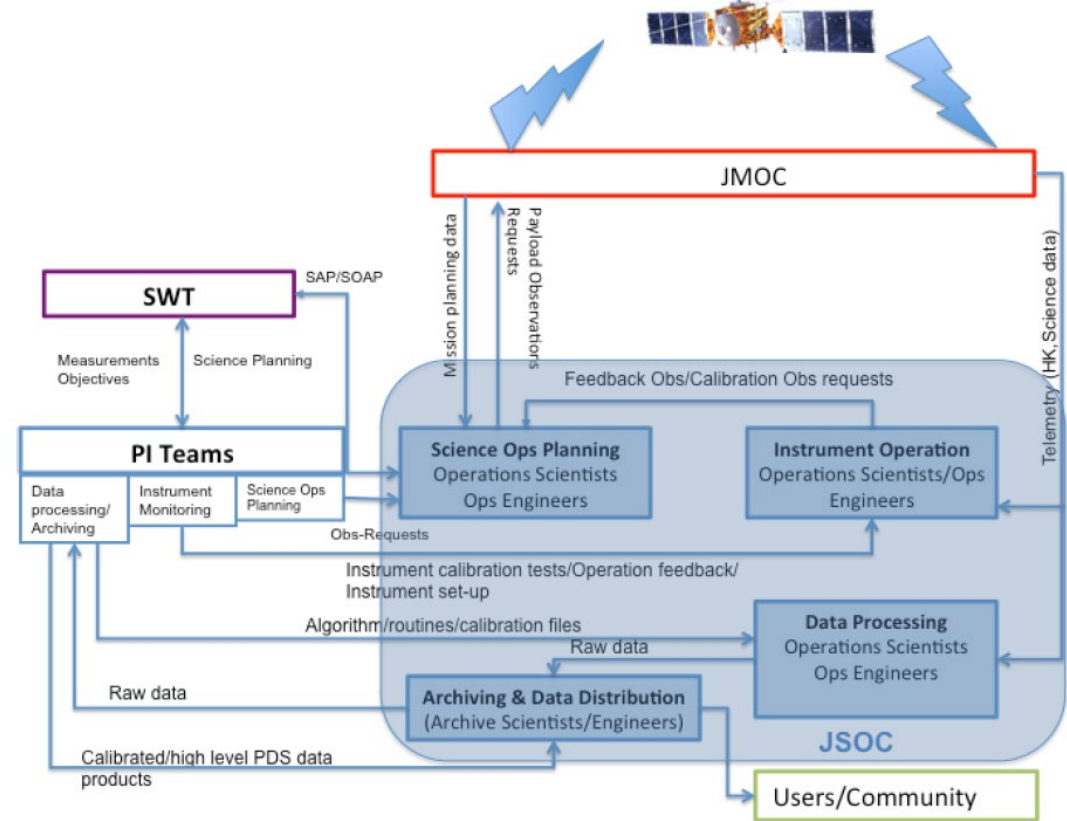
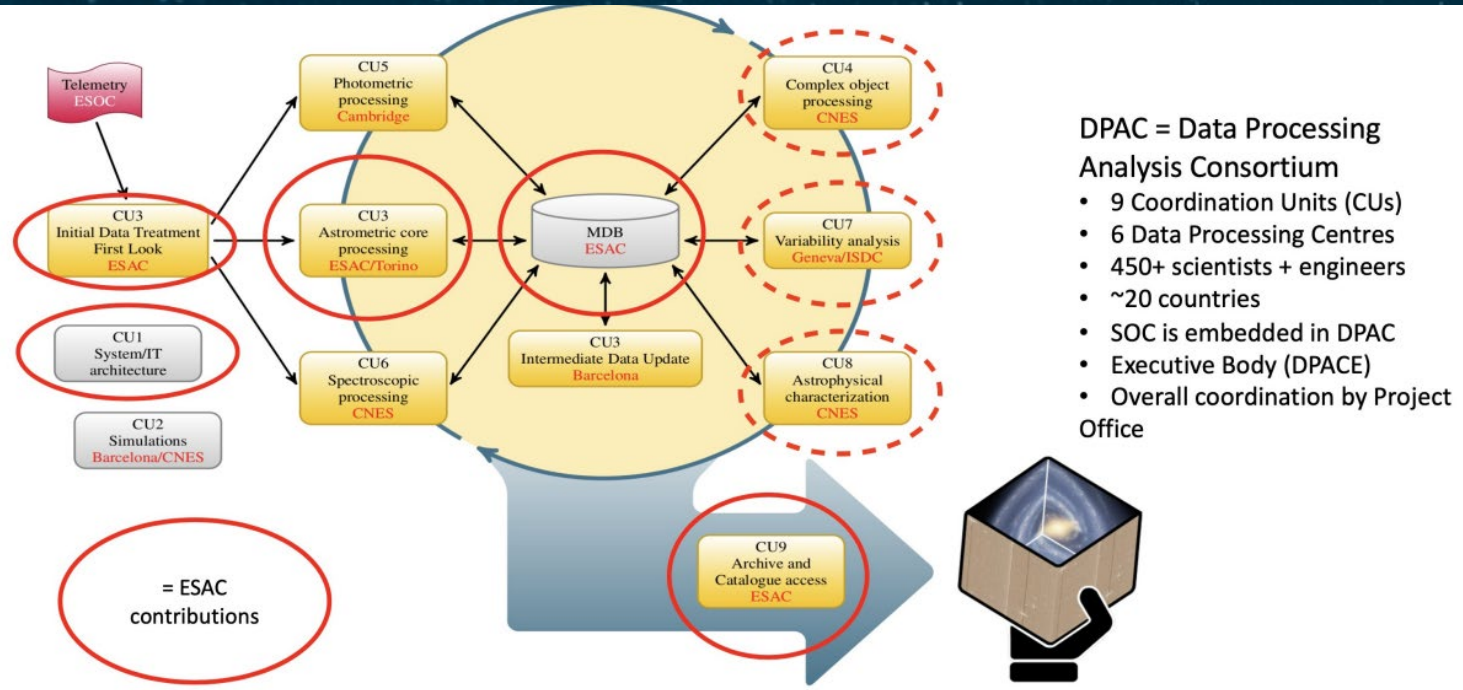




Lots of Software Systems

Systems need to be open towards external users

Distributed Science Ground Segments





esa



GAIA EARLY DATA RELEASE 3

esa

1 811 709 771
stellar positions

1 806 254 432
brightness
in white light

1 542 033 472
brightness
in blue light

1 540 770 489
colour

1 467 744 818
parallax and
proper motions

1 614 173
extragalactic
sources

1 554 997 939
brightness
in red light



#SpaceCare #ExploreFarther



ESAC Science Data Centre

SCIENCE MISSIONS

EUROPEAN SPACE AGENCY

SCIENCE & TECHNOLOGY

SIGN IN

esdc

ESA

ESDC » Home

Home

About ESDC

Archival Research Visitor Programme

Newsletter

Science Archives

Archive Image Browser

ESAsky

DOIs

User Survey Results

Videos

Scientific Tutorials

Publications

VOSpec

Euro-VO Registry

Archives User Groups

Contact Us

Share

Share

ESAC SCIENCE DATA CENTRE

Monthly Users (*)

ESDC Statistics

Monthly Downloaded (*)

Archive Total Size

24 876

129.1 TB

808.6 TB

* Monthly averages in 2022

Astronomy Science Archives

cheops

esasky

exosat

gaia

herschel

hubble space telescope

iso

jwst

lisa pathfinder

planck

xmm-newton

Heliophysics Science Archives

cluster

double star

proba-2

soho

solar orbiter

ulysses

The Planetary Science Archive

bepicolombo

cassini huygens

chandrayaan-1

exomars

giotto

mars express

rosetta

smart-1

venus express

LATEST NEWS

Tweets from @ESAesdc

Did you know you have access to more than 1000 background skies (Hierarchical Progressive Surveys = HiPS) and can load any of these in #ESAsky, sky.esa.int ? Thanks to the @Cdsportal @IVOastro HiPS Registry! Here's how:

ESA ESDC Retweeted

Replying to @esascience

Mission Day 00000

It's 18 April 2023 & the #SOHO era continues: over 27 years observing the Sun over 4500 comets discovered over 6000 papers written

planetary science archive

PSA 64.0

Number of selected items: 0

Basic Advanced

Expand all Collapse all

MISSIONS

Rosetta

Lander

Orbiter

BepiColombo

Chandrayaan-1

ExoMars 2016

GiOTTO

Ground Based

TARGETS

67P/C-G

10/Halley

4 Vesta

99/Tempel 1

21 Lutetia

46P/Wirtanen

1969R1

2067 Steins

C/2002 T7 (Linear)

INSTRUMENTS

ALICE

MIR0

NAVCAM

OSIRIS

NAC

WAC

VIRTIS (Rosetta)

300

ALP

INSTRUMENT TYPES

TIME

Q

Q

3D visualization of a comet nucleus

Postcard

Geometry

Product Identifier

Start Time

Stop Time

Target

Mission

Instrument

Processing Level

Release Date

<input type="checkbox"/>	N/A	PSA generated	W20160930T103740457ID4F11.FIT	2016-09-30 10:39:10.002	2016-09-30 10:39:10.017	67P/C-G	Rosetta	OSIRIS	4	2019-03-04
<input type="checkbox"/>		PSA generated	W20160930T103740457ID4F11.IMG	2016-09-30 10:39:10.002	2016-09-30 10:39:10.017	67P/C-G	Rosetta	OSIRIS	4	2019-03-04
<input type="checkbox"/>	N/A	PSA generated	W20160930T103740457ID4F11.FIT	2016-09-30 10:39:10.002	2016-09-30 10:39:10.017	67P/C-G	Rosetta	OSIRIS	4	2019-03-04
<input type="checkbox"/>		PSA generated	W20160930T103740457ID4F11.IMG	2016-09-30 10:39:10.002	2016-09-30 10:39:10.017	67P/C-G	Rosetta	OSIRIS	4	2019-03-04
<input type="checkbox"/>	N/A	PSA generated	W20160930T103740457ID4F11.FIT	2016-09-30 10:39:10.002	2016-09-30 10:39:10.017	67P/C-G	Rosetta	OSIRIS	4	2019-03-04
<input type="checkbox"/>		PSA generated	W20160930T103740457ID4F11.IMG	2016-09-30 10:39:10.002	2016-09-30 10:39:10.017	67P/C-G	Rosetta	OSIRIS	4	2019-03-04

Items/page: 100 Displaying 1 - 100 of 153637

ESAC SCIENCE DATA CENTRE

ESDC Statistics

Monthly Users (*)

Monthly Downloaded (*)

Archive Total Size

30 514

92.3 TB

908.2 TB

* Monthly averages in 2023

Planck Legacy Archive

ESA

WELCOME TO THE PLANCK LEGACY ARCHIVE

The Planck Legacy Archive provides online access to all official data products generated by the Planck mission.

Quick product search by file name

LATEST NEWS

Planck PR4 release

The Planck PR4 frequency maps are now available in the PLA. Users can access them in the Maps section or in the Maps Advance Search section un-checking 'Only Legacy' and selecting PR4. Further details can be found in the associated Publication from the Planck Collaboration A&A 643, A42 (2020).

2021-06-22 Planck Science Office

Your feedback matters! Take our survey and help us improve ESAsky and the ESA Astronomy Archives

PLANCK LEGACY ARCHIVE CONTENTS

MAPS

CATALOGUES

COSMOLOGY

TIMELINES AND RINGS

SOFTWARE, BEAMS AND INSTRUMENT MODEL

OPERATIONAL DATA

USEFUL INFORMATION

EXPLANATORY SUPPLEMENT

EXTERNAL DATA AND SOFTWARE

COLLABORATION PAPERS

USE OF PLANCK DATA

UPDATE HISTORY

PLANCK SCIENCE TEAM HOME

HELP FOR USER FORUM

eHST

Target

Radius (deg)

Observation

ID

Title

Wavelength

All

Min

Max

Instrument

Instrument Name

Product Type

HST_HLA_MAP

Reference date range

Date Range

Date Type

Science

SEARCH

CLEAR

Observation ID

Preview

Target

RA (deg)

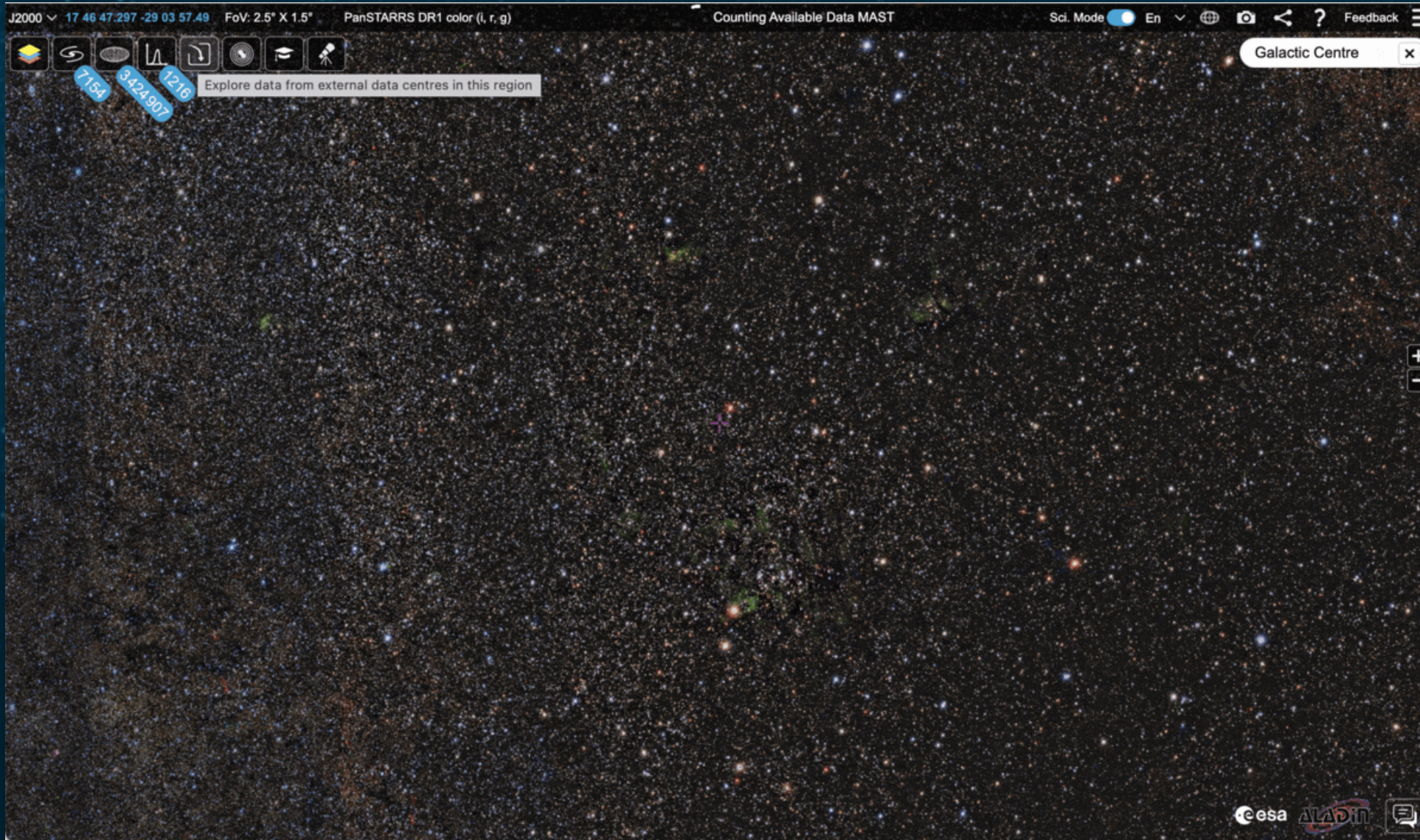
Dec (deg)

Instrument Name

Acquire

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hel_10110_05_acs_hrc_050w_j2005ga	NOC224-0N1	10.67802403207233	41.26812346364915	ACS/HRC	APERT
hel_10110_05_acs_wf_014w_j2005ga	ANY	10.74450250545705	41.26986119024578	ACS	APERT
hel_10110_05_acs_wf_014w_j2005ga	ANY	10.744431960100119	41.26926426564445	ACS	APERT
hel_10004_46_acs_hrc_050w_j2006ga	NOC221-011	10.638423841162349	41.29433564417947	ACS	APERT
hel_10110_05_acs_hrc_050w_j2005ga	NOC224-0N1	10.67802403207233	41.26812346364915	ACS/HRC	APERT
hel_10110_05_acs_wf_014w_j2005ga	NOC224-0N1	10.67802403207233	41.26926426564445	ACS	APERT

ESASky: an open window to the universe



Access to all astronomical data from ESA Archives and others (NASA, JAXA, Ground-based telescopes, ...)

Use of international data interoperability standards (Virtual Observatory)

Open Science Data

<https://sky.esa.int>

Lots of Software needs Strong PA&S support



Establish and get approval for specific Product Assurance and Safety requirements baseline for all Missions and Projects, in compliance with ESA PA&S policy.

Review Service Contractors PA&S plans, specifications and effort. Guide and monitor their implementation.

Encourage commonalities across the various mission' teams and contractors' teams, support to SCI-S System Engineering Environment common templates

Monitoring the development, integration and test activities, within ESA and the contractors, with quality assurance assessments, mandatory and key inspection points, test witnessing and configuration inspections.

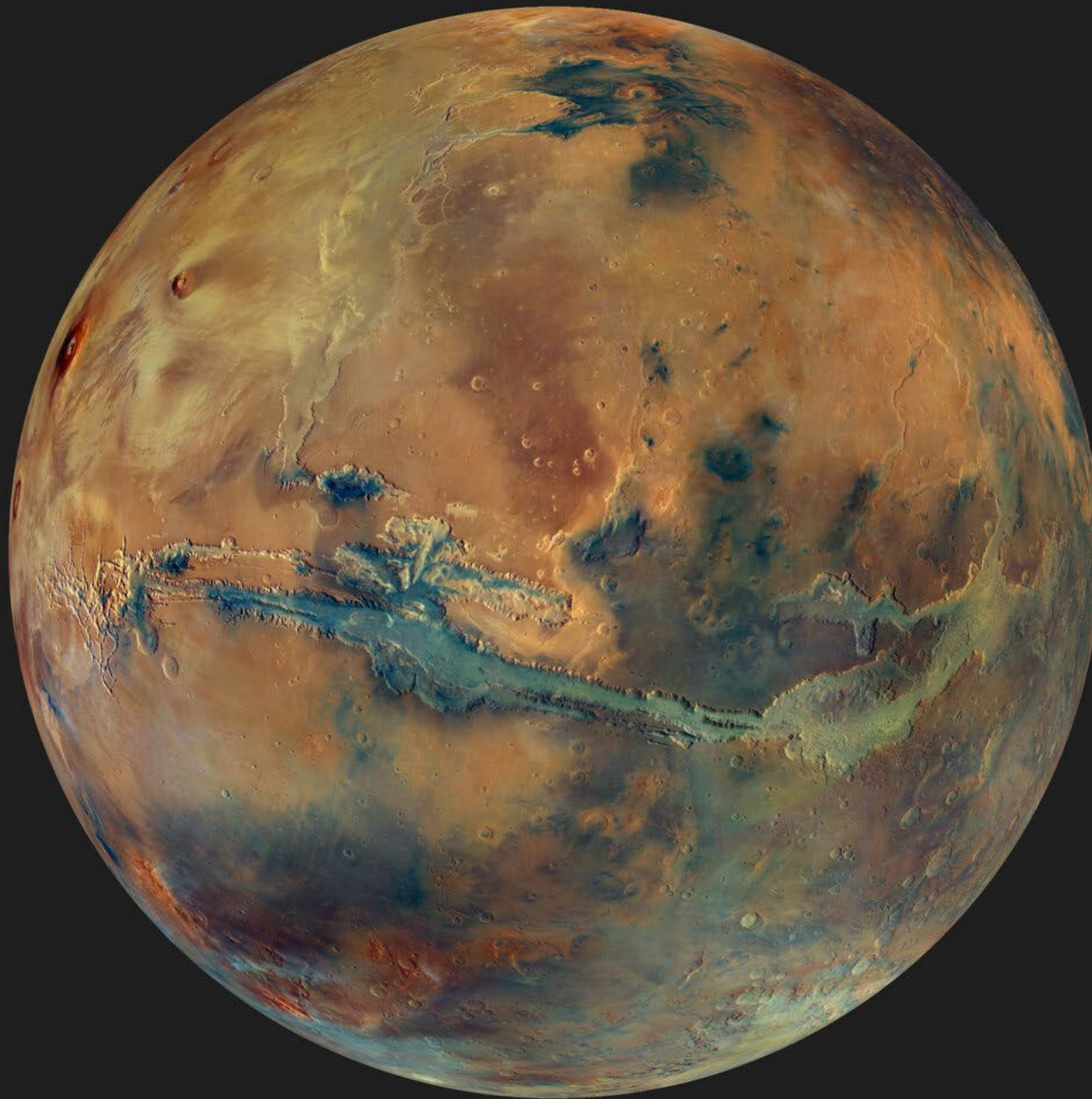
PA support to ESAC Project Reviews, and Lessons Learned Process

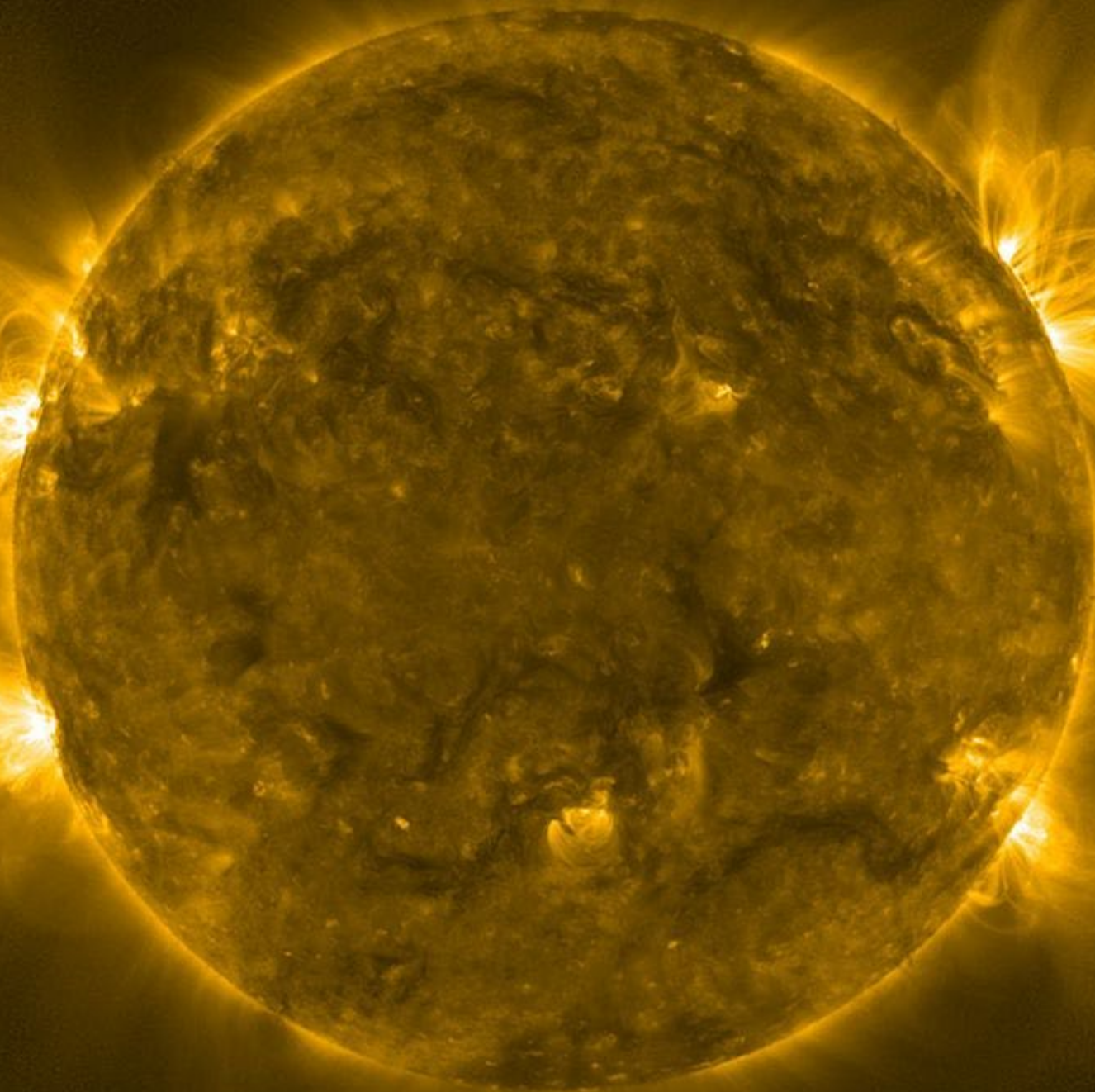
Support ESAC Software Licensing Board and missions in their request for open-source software

Why are we doing all this ?







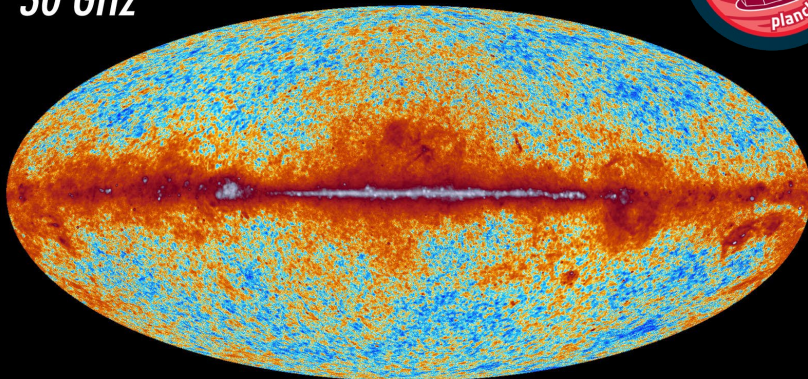


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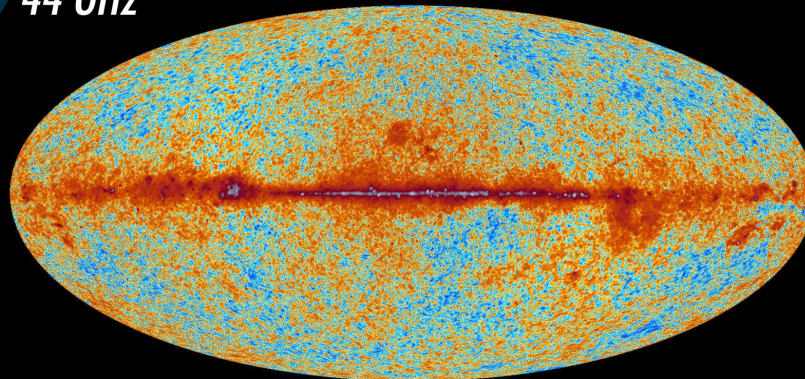


The Planck 2015 view of the sky

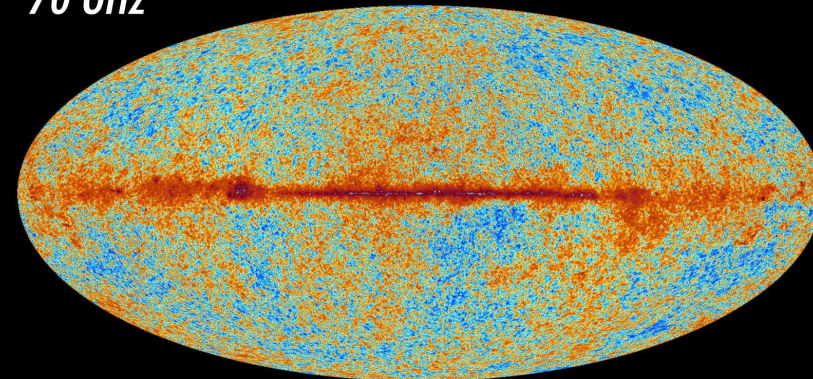
30 GHz



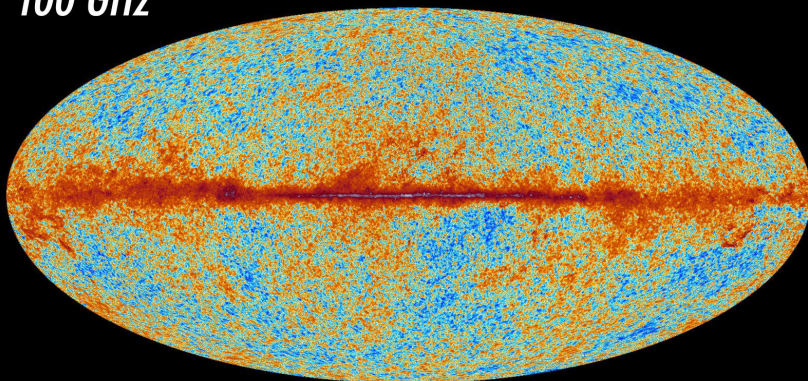
44 GHz



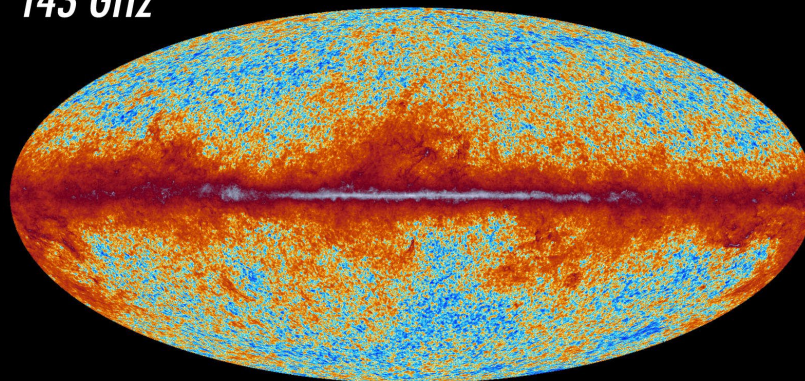
70 GHz



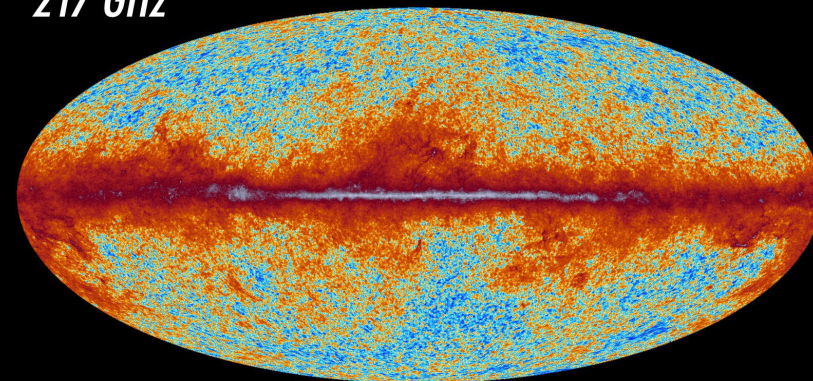
100 GHz



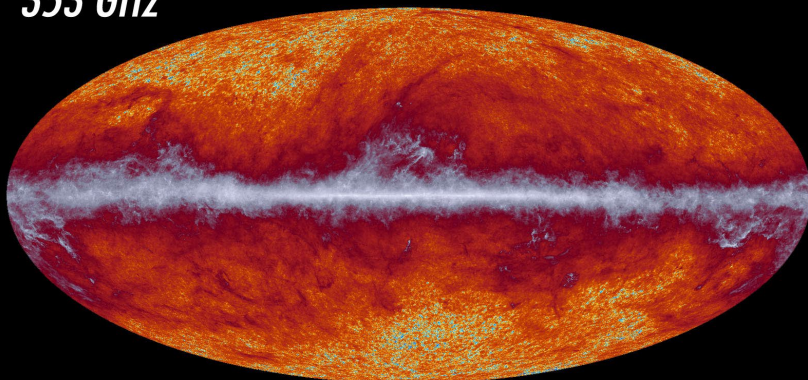
143 GHz



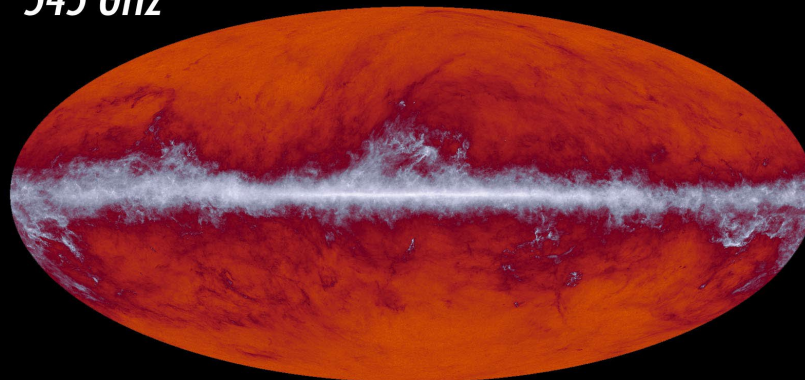
217 GHz



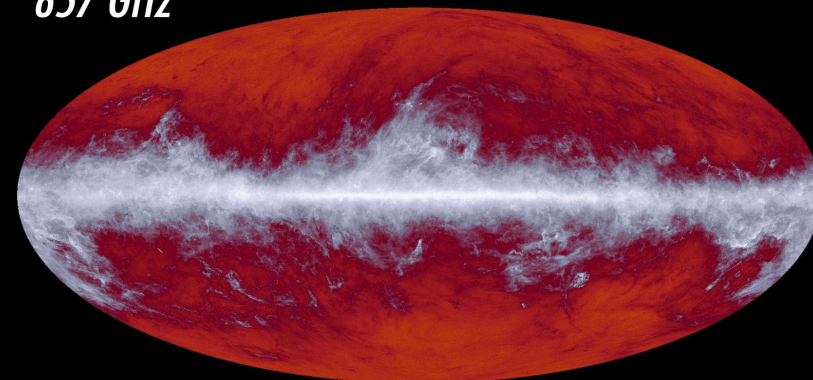
353 GHz

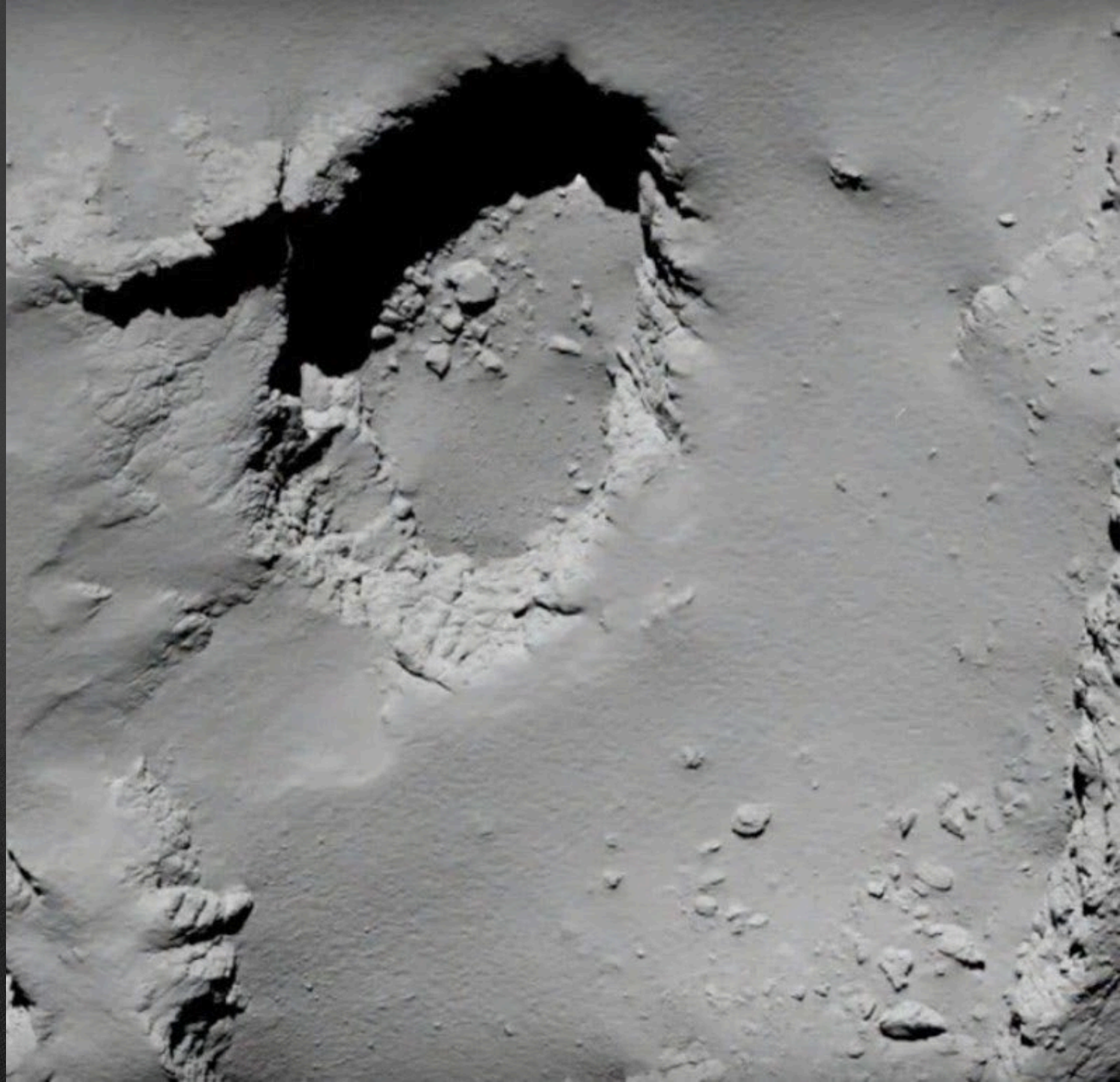
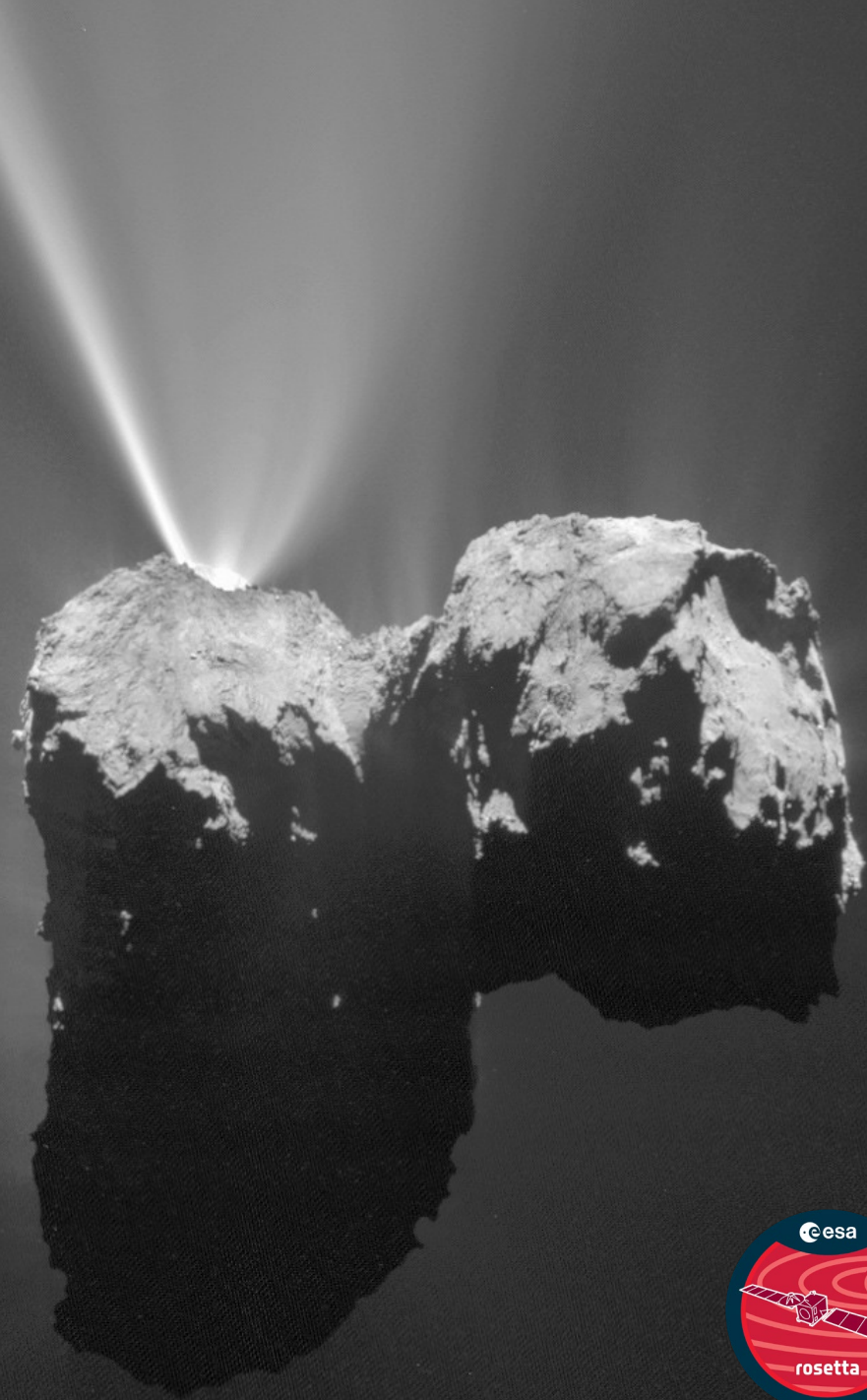


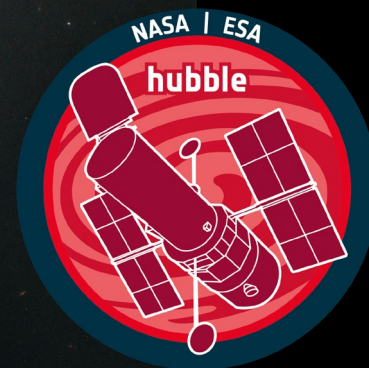
545 GHz



857 GHz







Thank you and enjoy the workshop !



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